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2002

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Kobayashi, Keiko, "Creative Methods of Reproduction: Two Japanese Weaving Innovations Developed In Imitation of Complex Foreign Textiles" (2002). *Textile Society of America Symposium Proceedings*. 397. <https://digitalcommons.unl.edu/tsaconf/397>

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CREATIVE METHODS OF REPRODUCTION: TWO JAPANESE WEAVING INNOVATIONS DEVELOPED IN IMITATION OF COMPLEX FOREIGN TEXTILES

Keiko Kobayashi

(English text edited by Melissa M. Rinne)

When a certain effect in textiles can be achieved on two different weaving apparatuses, it is common practice to assume the simpler method to be the more primitive and thus antecedent to the more advanced technique. This paper will discuss two unique Japanese weaving methods that testify to the fact that simple techniques do not always predate their more sophisticated counterparts. In these examples, the simpler weaving methods were actually created in imitation of preexisting textiles from other regions that had been woven on more complex looms. The first of these examples is the Japanese method for voided velvet; the other is a double cloth woven on the small island of Hachijo.

Thanks to its location at the end of the Silk Road, the island nation of Japan was for centuries a cultural reservoir for numerous treasures imported from its Asian neighbors and far-off continents.[□] Chinese and Korean artisans began immigrating to Japan in around the fifth century, bringing with them advanced technology from their respective cultures. At the same time, native Japanese artisans invented weaving methods to imitate the foreign textiles they saw, often without any knowledge of the original techniques they were trying to emulate.

Over Japan's long history, there have been two periods when the foreign influence on textile culture was especially strong. The first of these periods was during the 7th and 8th centuries, when large quantities of primarily Chinese textiles were imported into Japan. Some of these still exist today in the Shōsō-in Repository in the ancient capital of Nara. The other wave of foreign textiles into Japan took place between the 15th and 18th centuries, coming from such far reaches as Yuan- and Ming-dynasty China, India, Southeast Asia, and Europe.² Among the treasures imported during these centuries were numerous patterned weaves that had been created in far off lands using highly advanced techniques.

One of precious textiles in the later group was Chinese velvet.³ Japanese weavers had long puzzled as to how to make looped pile on the surface of silk fabrics, a secret that the Chinese had guarded for centuries. The way in which this technique eventually arrived in Japan is described in an Edo-period book,⁴ which tells that a metal rod was accidentally left in the loop of a velvet textile imported into Japan around 1650. With

[□]Yamanobe, Tomoyuki. *Nihon no Senshoku (Japanese Textiles)*, Mainichi Shinbunsha. Tokyo.1975.

² Those textile fragments were often kept on albums to study the design sources in Japan. This group of textiles is called *Meibutsugire*, literally means, famous fabrics.

³ There is another story of velvet that Japanese had seen first. In 1542 the gun was brought by Poltiguees to Tanegashima Island, south of Kyushu. This gun was wrapped with a velvet cloth.

⁴ The book in Edo: *Honcho Seji Danki (Japanese Social Events)* published in 1734, authour unknown. About this story with the name of book is written in *Mon-ori (Pattern Weave)*, by Kitamura, Tetsuro. Series of Textile Arts, Unsodo. Tokyo. 1974.

this fortuitous discovery, Japanese weavers finally understood that the raised pile loops were formed with wire rods.

To prepare the loom for weaving plain velvet, warps are rolled onto two back beams, one for the pile and the other for the ground warp. On such a loom, the loops of a plain velvet are formed by inserting wire rods on the surface of the ground weave. After taking the finished fabric with its many wire rods off the loom, the loops are cut along the top of the wire with a special knife (fig.1)—of a different shape from that used by Chinese weavers. The loop can be cut partially to create pile motifs or across the entire surface to create cut-velvet. Such velvets are used for *hanao*—the cloth straps on Japanese wooden shoes—and bags. Today, plain pile velvet continues to be woven only by two families in the city of Nagahama, in Shiga Prefecture. Nagahama artisans learned the technique of velvet weaving from Kyoto in the late 17th century.

Other fabrics introduced to Japan during the second wave of textile import included the highly sophisticated Chinese voided velvets woven with gold paper threads.⁵ In both China and Europe, the pile loops on such textiles were formed using a special rack to hold bobbins for individual warps. Without knowledge of how they had been made, Japanese weavers in the Nishijin textile district of Kyoto tried to imitate these precious textiles using the same double warp beams they used for plain velvet. Despite the fact that Nishijin was Japan's center for pattern weaves, however, the weavers there had no direct knowledge of the more advanced Chinese velvet techniques.

To solve the problems of differing tension in pile warps, which are inevitable when weaving voided velvet, the Nishijin weavers invented a system of suspending a weight to each pile warp. The weights were suspended over a pit (fig.2), approximately two meters in depth. When one of the weights touched the base of the pit, the weaver would stop weaving, cut the warp, pull it up, and tie on again at the cloth beam. When a warp broke, the weaver would go down into the pit using a ladder.

The pit for weights was used in Nishijin until 1960s and was even placed under looms with Jacquard mechanisms. It can still be seen today in the corner of a velvet factory, Somachō Company in Kyoto (fig.3,4), though weaving in this company is now done entirely on highly mechanized power looms.⁶ Nishijin weavers never used the special rack for individual bobbins that was favored by velvet weavers in China and Europe. One reason for this difference may have been that small Kyoto textile companies generally lacked the space to install such enormous implements. The Japanese pit method of dealing with pile warps is much simpler than the Chinese rack method, but the Japanese technique is the later one.

⁵ Chinese patterned velvet woven with supplementary gold paper threads shows the gold design on the surface between piles. Some textiles have the gold paper weft threads that run the surface and through the reverse side, that was woven with separated two sets of draw cords, one for pile warps and one for the main warps. No matter how the gold-leafed paper thread was woven on Chinese voided velvet textiles, Japanese weavers put the gold-leafed paper thread only running on the surface using a set of the draw cords only for the pile warps. On this textile, the gold-leafed paper wefts runs through the loops of pile warps and the finished textile shows exactly same surface as seen on Chinese patterned voided velvet. These velvet was called *Kinkazan* in Japan.

⁶ One of these looms is weaving *moquette*, cutting between a double cloth and the other is weaving the polyester lines instead of metal wire rods to hold pile loops.

A second Japanese weaving technique created in imitation of a more complex predecessor is the double cloth woven on the island of Hachijo. Before discussing the cloth, however, it behooves us to understand the location and textile culture of this small island. Hachijo Island, located 287 km south from the city of Tokyo, is part of Tokyo Prefecture. Ships, passengers, and wreckage lost at sea from China or southern islands⁷ often found their way to its shores due to Hachijo's surrounding ocean currents. The island also had an unusually high cultural level due to the fact that it was used by the government as a destination for exiled citizens during the 265 years of the Edo period.⁸ Most of the Japanese sent into exile on Hachijo were anti-establishmentarians who brought with them sophisticated crafts, culture, and knowledge from across Japan. These factors gave the island a high rate of exposure to the cultures of Japan and other countries.

Hachijo has a long history as a production site for kimono fabric. Beginning in 1572, such fabric was paid as tax to the Edo government, a practice that continued through the 19th century. Cloth from Hachijo was highly reputed for both its high quality silk and its colors, which were dyed using indigenous island plants.⁹ The cloth was called *kihachijo*, literally “the yellow of Hachijo.” The yellow color typical of *kihachijo* was dyed using a native plant called *kobunagusa* with an alum mordant obtained from the ash of camellia wood. It is interesting to note that the name Hachijo itself evokes textile connotations, meaning “eight *jo*,” or “eight lengths”—a unit of measure strongly associated with cloth.

Kimono fabrics on Hachijo were usually woven in plain weave on a semi-frame back-strap loom called an *izaribara*. Similar semi-frame back-strap looms were used in other parts of Japan, however those on Hachijo have the warp beam placed higher, creating a steeper incline than on other Japanese *izaribata* looms.¹⁰ The steeply diagonal warps on Hachijo looms used for plain weave actually look more like Korean or Chinese looms for plain weave than their Japanese counterparts.

A second traditional textile produced on Hachijo Island was twill-weave silk. Twill weaves were highly unusual among kimono producing regions in Japan, which traditionally concentrated only on plain weave kimono fabrics. During the Edo period, almost all Japanese pattern weaves were woven on draw looms in the Nishijin weaving district of Kyoto. Nishijin weavers also produced twill or satin weaves using treadle looms equipped with the necessary harnesses. Such treadle loom technology, however, never reached the small island in the Tokyo Bay.

⁷ Drifters reached the ashore of Hachijo were 199 boats in 390 years. The maximum was 27 drifting boats and 300 drifters in a year. The drifting ashore was caused by *kuroshio*, the Black Current, along the south of Japan island. Documented on *Hachijo Jikki*. (see #11)

⁸ Hachijo was an exile island from 1606 to 1871. 1866 exiles were sent in 265 years. Documented on *Hachijo Jikki*.

⁹ Natural dyes in Hachijo variation of combination of three colors for stripes or chechers on *kihachijo*. Plants are Yellow: *kobunagusa* or Hachijo *kariyasu*, *Arthraxon hispidus* (Hack.) Makino
Brown: *tabunoki*, *Machilus thunbergii* Sieb. et Zucc. Containing tannic acid.
Black: *Shii* (*pasania*), *Castanopsis cuspidate* (Thunb.) Schottky. With iron mordant in the mud field.

¹⁰ These looms were replaced to treadle loom with counter-balanced two shafts around 1890.

The twill-weave textiles woven on Hachijo were called *hattan*. They were generally 2.2 twill. Fabric samples in an album in the island's museum show that there were at least six variations of diamond-patterned and striped twill. These twill fabrics were highly valued by the Edo government as tax cloth and were used for the *obi* sashes tied over men's kimonos. An illustration in an Edo-period document shows Hachijo weavers using back-strap looms with a small frame to hold the warp beam and heddle rods that were raised by an assistant (fig.5). This is a method created without knowledge of treadle looms. Inspired by twill weave fabrics that arrived from the outside world, weavers on Hachijo figured out how to weave the patterns using the simple tools they had at hand. Using this method, a weaver and her assistant could weave only five to seven cm. of twill per day.

Double cloth textiles woven on Hachijo were produced on the simplest type of back-strap loom. Since double cloth has two layers, the weavers on this small island conceived a method of weaving using multiple string heddles that were attached to both the upper side and the underside of the warps (fig.6). The upper heddle rods were pulled up when weaving the top layer and the under heddle rods were pulled down when weaving the bottom layer (fig.7). These multiple heddle rods pulling up and down formed sets that functioned as short pattern repeats. Double cloth woven with simple geometric patterns was used to make narrow *obi* sashes to tie on kimonos for the weaver's personal use.

As mentioned earlier, numerous political exiles were sent to the island after the year 1606, leading to a high rate of exposure among the islanders to the developed craft traditions of the main islands. Today, numerous extant documents related to Hachijo Island written by exiles and officials of the Edo governments are kept in the Tokyo Metropolitan Archives.¹¹ Among them, we find mention of a checkered double cloth *obi* sash in a book published in 1811.¹² Checkers are perhaps the simplest type of pattern weave and thus are usually the initial pattern to be woven. Hachijo artisans also began weaving patterned double cloth with checkered patterns, and they were the only patterns used on men's *obi* produced for commercial purposes.

Like Chinese velvets, many Chinese double cloth textiles were imported into Japan after the 16th century. On the Japanese main islands, these sparked the fashion during Edo period for double cloth textiles with detailed and uniquely Japanese designs. For example, during the Qing dynasty in the 17th century, Chinese weavers created narrow

¹¹ In the Library of Tokyo Metropolitan Archives (1-13-17, Kaigan, Minato-ku, Tokyo), there are many documents related to the seven islands in Tokyo prefecture including Hachijo Island. About *Hachijo Jikki*, Kondo, Tomizo, one of the exiles in late Edo, had documented all events, crafts, and other cultural aspects from 1845 to 1855. In 1880, Tokyo Police department found this documents and added other documents of two important families in Hachijo to be compiled by Kondo, Tomizo as *Hachijo Jikki*. It was published in modern language by the publisher in Tokyo, called Ryokuchi-sha, in 1964.

¹² *Hachijo Saiiori (Costume and Weaving in Hachijo)* published in 1811, by Hattori Kuzaemon Yoshitaka documented the obi patterned with *ichimatsu*, checkers. *Hachijo Jikki*, Vol.I, written by Kondo Tomizo also documented the man's obi that has been called *kiriko-obi*, and explained that *kiriko* means *ichimatsu* checkers. Kondo mentioned that *ichimatsu* obi with 15 cm. wide was highly valued, since it took for long time to finish it (Vol.I, in 8th). There was no illustration of double cloth obi, but he wrote that the loom to weave *ichimatsu* needs three upper heddles and three under heddles and two shed sticks and two cross rods. It is exactly the back-strap loom for *kappeta*.

bands of double cloth with intricate small designs.¹³ Approximately 10 mm. in width, these bands would be used as strings on painting scrolls. These inspired Japanese weavers in Kyoto to produce narrow bands of double cloth weave on their treadle looms. Connoisseurs of the Japanese tea ceremony used the double cloth bands as straps for the boxes of precious tea bowls and other implements.

Given the vogue for double cloth bands on the main islands and the high cultural level of the Japanese exiled to the island, it was inevitable that double cloth be brought to Hachijo during the Edo period. Though we cannot identify exactly which textiles arrived when. It is clear from the textile history of the island that after seeing these complex textiles, which had been woven on more developed looms, Hachijo artisans came up with their own methods of reproducing warp-faced double cloth weaves on the simplest of back-strap looms.

The ingenuity of weavers on the island becomes evident when we examine the technique by which they did this. The first patterned double cloth textiles woven on Hachijo were relatively simple in comparison to their sophisticated imported counterparts and had only the basic checkered designs. Such weaves required eight heddle rods, four suspended above for the upper layer and four hanging below for the under layer (fig.8), although the last heddle rods on each side would normally be replaced with a shed stick.

Over time, the patterns became more complex, encompassing variations of checkers, zigzags, crosses, triangles, and diamonds (fig.9). The maximum number of sheds that a weaver could manage on the back-strap loom was twelve: five heddle rods and one shed stick on each layer. For this reason, the designs were limited to simple geometric patterns. Such patterns, developed from the simple checkers, would be woven only on seven to eight cm wide women's *obi* sashes. These sashes were not used for commercial purposes, as were the men's checkered sashes, but were instead made only for personal use.

The loom for Hachijo double cloth is prepared with four warps in two colors. These four warps always stay together as a unit (fig.10). The system of selecting warps from a unit of four does not differ from the system for weaving double cloth on the doobby loom (fig.11). After all the warps were prepared on the rods, the string heddles would be made and strung on narrow split bamboo rods. Into either end of each bamboo rod putting through the string heddles was inserted a narrow heddle rod to be a bowlike shape used as a handle by the weaver (fig.12). On this basic back-strap loom, the opposite end of the warp would simply be tied to a pole inside the house. The weaver would alternately pull up or down the upper and under heddle rods as she circulated a thick weft. This she would beat in strongly with a sword-like wooden beater called a *kappeta* — hence the name of the weave by outsiders—all the while controlling the warp tension with her body.

Conclusion

Researchers have long assumed the very simple back-strap loom used to weave double

¹³ Author suspects this kind of double cloth weave bands were woven on Chinese multi-shaft treadle loom called ding quao loom that is suitable to weave narrow band, with supplementary warp patterning or double cloth weave.

cloth on Hachijo Island to be the sole remaining example of the original Japanese loom for pattern weaves. The isolation of the island, they have argued, justifies the looms existence into the present day.¹⁴ From the weaver's point of view, however, there is nothing strange about the simpler methods appearing later than complex techniques: it is only natural to try to imitate unknown weave structures using the looms at hand, however primitive they may be.

Due to its historical circumstances as an isle of exile and its location, Hachijo became a sort of microcosm, absorbing external cultural influences from not only China and other Asian neighbors but also from Japan proper. The double cloth woven on Hachijo exemplifies that the simpler techniques used in home industries cannot be necessarily be pegged as antecedent to more developed apparatuses found in factories. Japanese velvet technology done in small workshops is another good example, but it is not the only one.

We find similar ingenuity in the extra heddle rods on a semi-back strap loom used to weave *hanaori* patterned textiles in Okinawa, Japan: in *saganishiki* patterning technique of picking up paper warps by hand to create sophisticated patterns. This technique was invented by the wife of provincial lord of Nabeshima in late Edo, who had been inspired by inter-woven bamboo pattern on her ceiling: in Laotian and Thai looms using a vertical heddle to create pattern repeats in warp direction. Each of these examples was born out of the ingenuity of local weavers in imitation of patterned textiles woven on more complex looms or apparatuses.

¹⁴ The weaver of *kappeta-ori*, Bin Tamaoki was designated as Mukey Bunkazai, Cultural Property (so called Living Treasure), in 1965, when only Tamaoki was weaving this *kappeta* double cloth weave band.

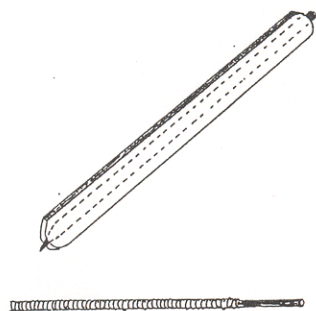


Fig. 1 Japanese knife for cutting pile loops along the top of the wire. The knife, about 12 cm long, is a sword-like cutter installed inside a sheath.

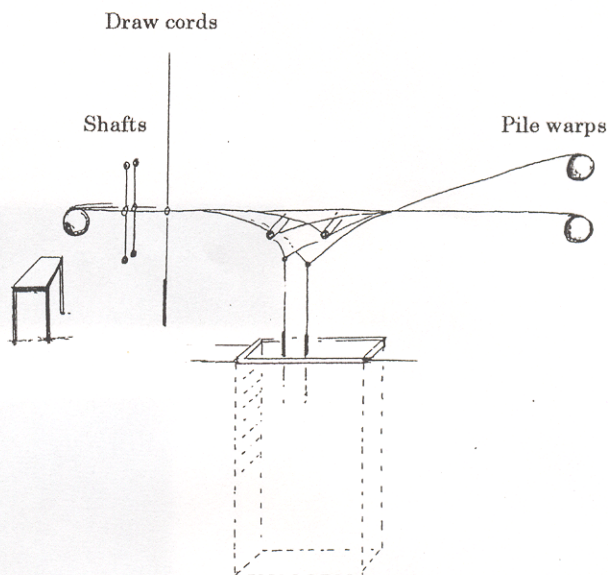


Fig. 2 A Japanese velvet loom with a system of weights controlling the pile warp tension. The weights hang into a pit.



Fig. 3 The pit at the velvet weaving company, Somacho Co. Ltd. in Kyoto. The pile warps are divided into two groups so that when a warp broke, the weaver could easily find a broken thread.

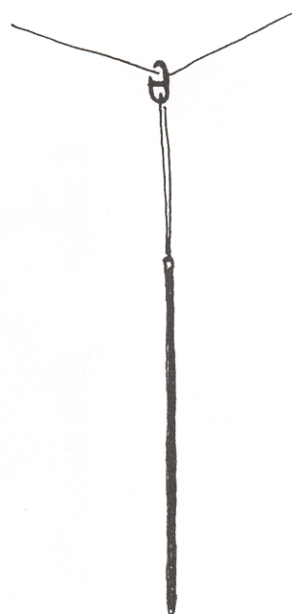


Fig. 4 The weights are suspended from glass rings (mails) each of which are connected to an individual pile warp.

Fig. 5 The back-strap loom for weaving 2.2 diamond-patterned twill. An assistant sitting on the tatami mat is opening a shed with a wooded sword. Another four heddle rods (including the last shed stick) are installed in the warps.

An illustration from the book *Hachijo Miyake Kohzujima Shokugyôzu* (Illustration of Professions in the Islands of Hachijo, Miyake and Kozujima) owned by the library of the Tokyo National Museum (part of the Tokugawa book collection), the date and author are unknown, but the most probable of the date of this book is the late Edo period, early 19th century.

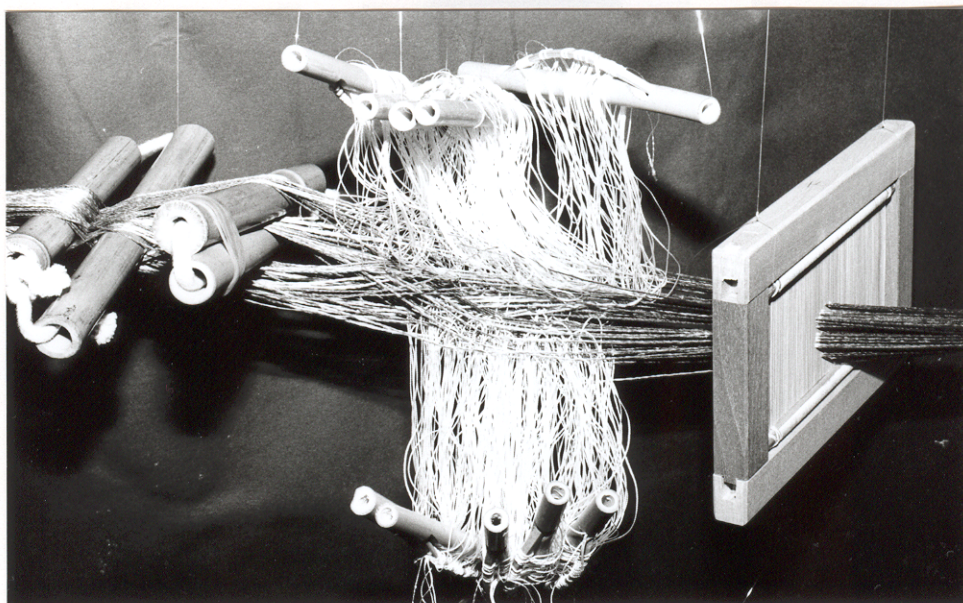
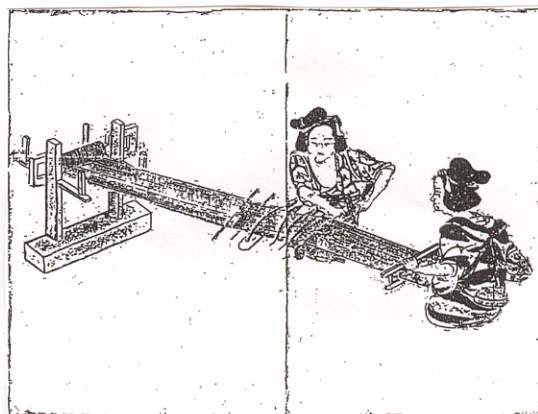


Fig. 6 The back-strap loom for Hachijo double cloth with upper heddle rods for the top layer and under heddle rods for the bottom layer.

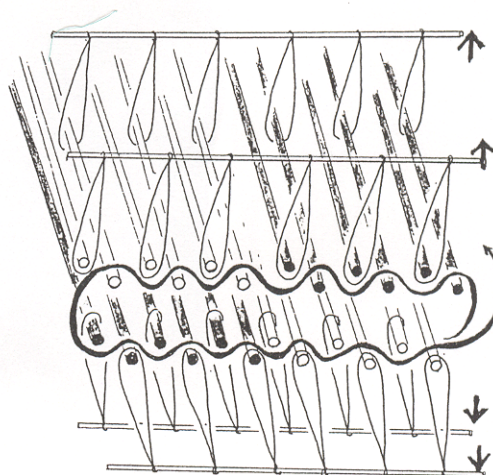


Fig. 7 Hachijo sashes are made from warp-faced, one-weft double cloth flattened tubes with the two layers interlocked at the edges and at all points where the colors change in a horizontal or diagonal plane in the cloth.

Pole in the house

Upper heddle rods

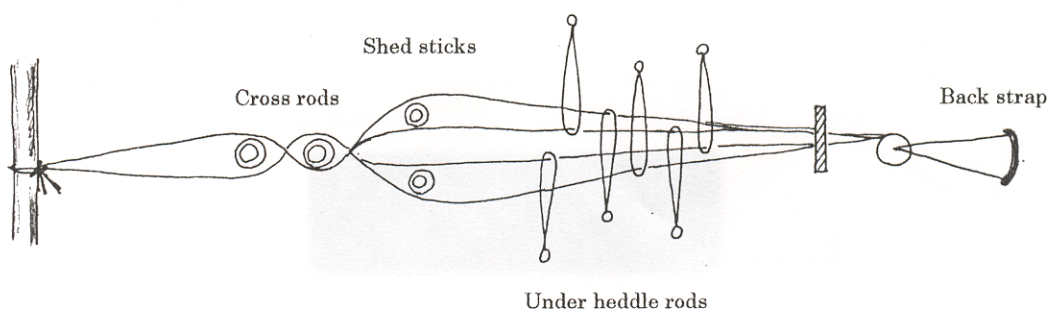


Fig. 8 Eight heddle rods (including shed-sticks) for weaving checkered patterns.

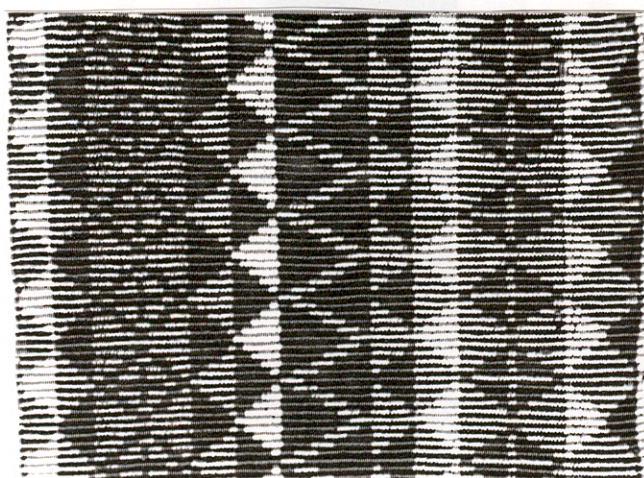


Fig. 9 Pattern variations developed from checkered patterns need twelve heddle rods, 6 above and 6 below (including shed-sticks). The order of opening the sheds is reversed to complete the vertically symmetrical patterns. 30 warps / cm. and 7 wefts / cm.

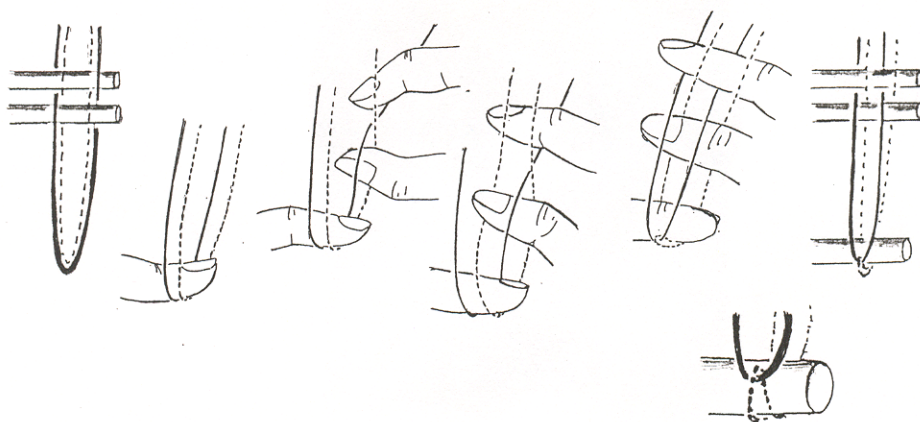
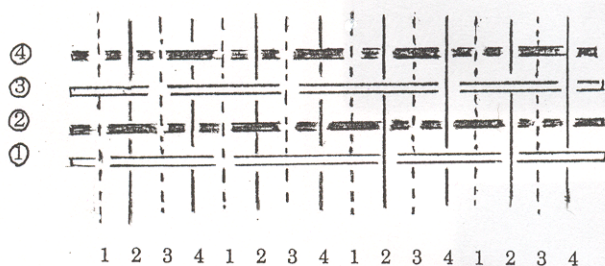


Fig. 10 The rearrangement of colored threads as a unit. The order of four warps is rearranged when the cross is taken at the starting loop of the warping. This process should be done before the preparation of the string heddles.

Fig. 11 The string heddle preparation uses a system of selecting warps from a unit of four. The weaver first selects one of every four warps for the upper layer and then three in each set of four warps. To prepare the heddles, the shed making sticks, bamboo rods split in half, are inserted in order, alternating upper and lower heddles. Which layer they belong to can be discerned from the orientation of the split bamboo: the smooth outer surface of the bamboo sticks is up for sheds of the top layer(①&③) and the split inside is up for sheds of the under layer(②&④).



4 warp threads are always inserted through each dent of the reed.

Fig. 12 The Hachijo double cloth back-strap loom owned by Professor Tomoyuki Yamanobe, now kept in the Tbhyaama Museum, Saitama Prefecture.

The bamboo heddle rods are curved like a bow.

